NOISE ABATEMENT DECISION REPORT

San Diego Freeway (I-405) Improvement Project
SR-73 to I-605

Orange and Los Angeles Counties

12-ORA-405 PM 9.3/24.2 / 07-LA-405 PM 0.0/1.2
12-ORA-22 PM R0.7/R3.8 / 12-ORA-22 PM R0.5/R0.7
12-ORA-73 PM R27.2/R27.8 / 12-ORA-605 PM 3.5/R1.6
07-LA-605 PM R0.0/R1.2

EA 0H1000
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September 2011

Caltrans

STATE OF CALIFORNIA
Department of Transportation

Final Noise Abatement Decision Report

I-405 Improvement Project
In Orange and Los Angeles Counties from SR-73 to the
I-605 Interchange

12-ORA-405 PM 9.3/24.2 / 07-LA-405 PM 0.0/1.2
12-ORA-22 PM R0.7/R3.8 / 12-ORA-22 PM R0.5/R0.7
12-ORA-73 PM R27.2/R27.8 / 12-ORA-605 PM 3.5/R1.6
07-LA-605 PM R0.0/R1.2

EA 0H1000

September 2011

Prepared By: _____ Date: 9/1/11

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List of Abbreviated and Specialized Terms

Benefited Residence	A dwelling unit expected to receive a noise reduction of at least 5 dBA from the proposed abatement measure
Caltrans	California Department of Transportation
Category B	Land use sensitivity category defined by Caltrans and including residential, school, church and hospital uses
Category C	Land use sensitivity category defined by Caltrans as commercial uses with no outdoor frequent use areas
CCD	Caltrans Cost Database
CEQA	California Enviornmental Quality Act
Critical Design Receiver	The design receiver that is impacted and for which the absolute noise levels, build vs. existing noise levels, or achievable noise reduction will be at a maximum where noise abatement is considered
dB	A measure of sound pressure level on a logarithmic scale
dBA	A-weighted sound pressure level
EIR/S	Environmental Impact Report/ Environmental Impact Statement
FHWA	Federal Highway Administration
Leq	Equivalent sound level (energy averaged sound level)
Leq[h]	A-weighted, energy average sound level during a 1-hour period
NAC	Noise Abatement Criteria
NADR	Noise Abatement Decision Report
NSR	Noise Study Report
PS&E	Plans, Specifications and Estimates
Reasonable Allowance	A single dollar value—a reasonable allowance per benefited residence that embodies five reasonableness factors
TeNS	Technical Noise Supplement to Protocol

1. Introduction

The Noise Abatement Decision Report (NADR) presents the preliminary noise abatement decision as defined in the Traffic Noise Analysis Protocol (Noise Protocol; Caltrans, 2006) published by the California Department of Transportation (Caltrans). The information provided in this report has been approved by a California licensed professional civil engineer. The project-level Noise Study Report (NSR) (Caltrans, 2011) prepared for this project is hereby incorporated by reference.

1.1. Noise Abatement Assessment Requirements

Title 23, Code of Federal Regulations (CFR), Part 772 of the Federal Highway Administration (FHWA) standards (23 CFR 772) and the Noise Protocol require that noise abatement be considered for projects that are predicted to result in traffic noise impacts. A traffic noise impact is considered to occur when future predicted design-year noise levels with the project "approach or exceed" Noise Abatement Criteria (NAC) defined in 23 CFR 772 or when the predicted design-year noise levels with the project substantially exceed existing noise levels. A predicted design-year noise level is considered to "approach" the NAC when it is within 1-dB of the NAC. A substantial increase is defined as being a 12-dB increase above existing conditions.

FHWA standards in 23 CFR 772 require that noise abatement measures that are reasonable and feasible and are likely to be incorporated into the project be identified before adoption of the final environmental impact report/environmental impact statement (EIR/S).

The Noise Protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. Before publication of the draft EIR/S, a *preliminary noise abatement decision* is made. The preliminary noise abatement decision is based on the *feasibility* of evaluated abatement and the *preliminary reasonableness determination.* Noise abatement is considered to be acoustically feasible if it provides noise reduction of at least 5-dB at receivers subject to noise impacts. Other nonacoustical factors relating to geometric standards (e.g., sight distances), safety, maintenance, security, geotechnical considerations, and utility relocations can also affect feasibility.

The preliminary reasonableness determination is made by calculating an allowance that is considered to be a reasonable amount of money, per benefited residence, to spend on abatement. This *reasonable allowance* is then compared to the engineer's cost estimate for the abatement. If the engineer's cost estimate is less than the allowance, the preliminary determination is that the abatement is reasonable. If the cost estimate is

higher than the allowance, the preliminary determination is that abatement is not reasonable.

The NADR presents the preliminary noise abatement decision based on acoustical and nonacoustical feasibility factors and the relationship between noise abatement allowances and the engineer's cost estimate. The NADR does not present the final decision regarding noise abatement; rather, it presents key information on abatement to be considered throughout the environmental review process, based on the best available information at the time the draft EIR/S is published. The final overall reasonableness decision will take this information into account, along with other reasonableness factors identified during the environmental review process. These factors may include:

- impacts of abatement construction,
- public and local agency input,
- life cycle of abatement measures,
- views/opinions of impacted residents, and
- social, economic, environmental, legal, and technological factors.

Based on the studies so far accomplished, Caltrans intends to incorporate noise abatement measures in the form of barrier(s) at locations, with respective lengths and heights as shown in this Noise Abatement Decision Report. If during final design the project has substantially changed, noise barriers might not be provided. The final decision regarding the construction of noise barriers will be made after completion of the public involvement process during the final project design process.

1.2. Purpose of the Noise Abatement Decision Report

The purpose of the NADR is to:

- summarize the conclusions of the NSR relating to acoustical feasibility and the reasonable allowances for abatement evaluated,
- present the engineer's cost estimate for evaluated abatement,
- present the engineer's evaluation of nonacoustical feasibility issues,
- present the preliminary noise abatement decision, and
- present preliminary information on secondary effects of abatement (impacts on cultural resources, scenic views, hazardous materials, biology, etc.).

The NADR does not address noise barriers or other noise-reducing treatments required as mitigation for significant adverse environmental effects identified under the California Environmental Quality Act (CEQA).

1.3. Project Description

The California Department of Transportation (Caltrans), in cooperation with Orange County Transportation Authority (OCTA), proposes to improve mainline freeway and interchanges on Interstate 405 (I-405) for approximately 16 miles (mi). The proposed project is primarily located in Orange County, California, on I-405 (ORA PM 9.3/24.2; LA PM 0.0/1.2) between State Route (SR)-73 (ORA PM R27.2/R27.8) and Interstate 605 (I-605) (ORA PM 3.5/R1.6); LA PM R0.0/R1.2). Encroachments into Los Angeles County and work on SR-22 (ORA PM R0.7/R3.8 and R0.5/R0.7) are associated with signing and striping to accommodate the transition from the existing to proposed facility (hereafter referred to as the "Project"). The proposed project would relieve congestion and improve operational efficiency on I-405 between SR-73 and I-605. Within the limits of the proposed project, I-405 is a controlled-access highway facility with a fenced ROW, separated by grade from crossing traffic, with vehicular access limited to interchanges. Within the project area, I-405 consists of 8 to 12 mixed-flow general purpose (GP) lanes and two high-occupancy vehicle (HOV) lanes.

1.3.1. Project Alternatives

1.3.1.1 Common Design Features of Build Alternatives

Build Alternatives 1, 2, and 3 would include the following features:

- One GP lane would be added in each direction of I-405 from Euclid Street to the I-605 interchange.
- Travel lanes on the I-405 mainline would be 12-foot-wide, and right side shoulders would be 10-foot-wide.
- The pedestrian bridge and local street overcrossings proposed for complete replacement under Alternatives 1, 2, and 3 are the following:
  - Ward Street
  - Talbert Avenue
  - Brookhurst Street
  - Slater Avenue
  - Bushard Street
  - Warner Avenue
  - Magnolia Street
  - Pedestrian overcrossing near Heil Avenue
  - Newland Street
  - Edinger Avenue

- McFadden Avenue
- Bolsa Avenue
- Goldenwest Street
- Edwards Street
- Westminster Boulevard
- Springdale Street
- Bolsa Chica Road

- The Euclid Street/Ellis Avenue undercrossing bridge would be modified and extended.
- Two railroad overheads would be modified and extended.[1]
- Each build alternative would include interchange reconfigurations at Euclid Street, Ellis Avenue, Brookhurst Street, Magnolia Street, Warner Avenue, Beach Boulevard, and Westminster Boulevard.
- Maintenance vehicle pullouts (MVP) would be included in various locations under each build alternative.

1.3.1.2 Unique Design Features of Build Alternatives

Alternative 1 – Add One GP Lane in Each Direction

Alternative 1 would add a single GP lane in each direction of I-405 from Euclid Street to the I-605 interchange.

Alternative 1 would provide a full standard highway cross section, with 12-foot-wide mainline travel lanes as well as 10-foot-wide shoulders on both left (inside) and right (outside) sides in both directions.

Alternative 2 – Add Two GP Lanes in Each Direction

Alternative 2 would add one GP lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternative 1), plus add a second GP lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second GP lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street.

Alternative 2 would provide a full standard highway cross section, with 12-foot-wide mainline travel lanes and shoulders on the left and right sides in both directions. Right side (outside) shoulders would be 10-foot-wide, while left side (inside) shoulders would

[1] The freeway passes over the Union Pacific Railroad (UPRR) on the Bolsa Overhead (Bridge No. 55-269 at PM 17.21) and the U.S. Navy Railroad on the Navy Overhead (Bridge No. 55-272 at PM 18.36).

have a maximum width of 10 foot with a provision for a widened left shoulder for HOV enforcement areas under consideration.

Alternative 3 – Express Facility

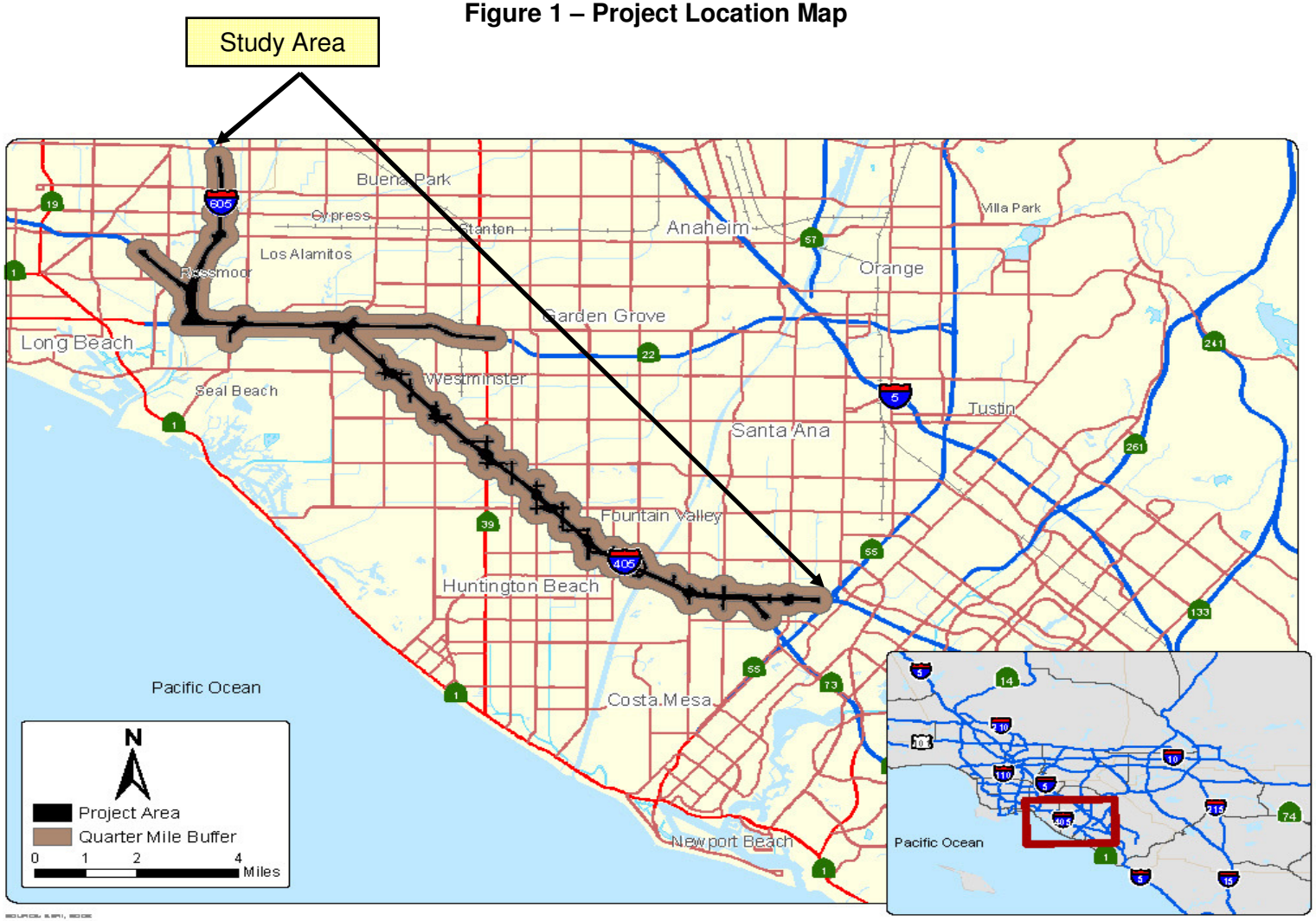
Alternative 3 would add one GP lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternatives 1 and 2), plus add a tolled express lane in each direction of I-405 from SR-73 to I-605. The tolled express lane would be placed beside the existing HOV lane in each direction. The existing HOV lanes and new toll lanes would be managed jointly as an Express Lane Facility with two lanes in each direction.

Alternative 3 would provide a full standard highway cross section, with 12-foot-wide mainline travel lanes and shoulders on the left and right sides in both directions. Right side (outside) shoulders would be 10-foot-wide, while left side (inside) shoulders would have a maximum width of 10 feet with a provision for a widened left shoulder for enforcement areas under consideration. The joint HOV/toll lane Express Lane Facility would be separated from the GP lanes by a 1 to 4 feet buffer.

1.3.1.3 No Build (No Action) Alternative

The No Build Alternative provides a "baseline" for comparing impacts associated with the build alternatives because environmental review must consider the effects of not implementing the proposed project. The Project Baseline conditions under the No Build Alternative would provide no additional lanes or interchange improvements to the I-405 corridor. The project area would continue to operate with no additional improvements and would not achieve the project's stated purpose and need.

Figure 1 – Project Location Map



1.4. Affected Land Uses

A field investigation was conducted to identify land uses that could be subject to traffic noise impacts from the proposed project. Single-family residences, multi-family residences, schools, parks, religious institutions, and hotel/motels were identified as Activity Category B land uses with outdoor frequent use areas along the proposed project alignment. Numerous commercial uses in the area are Activity Category C land uses with no outdoor frequent use areas.

The dominant land uses within the project study area include low and medium density residential (single- and multiple-family), commercial (neighborhood and regional), and light industrial (general manufacturing). Topography along the corridor is relatively flat where the majority of local traffic roadways cross over I-405. There are also two train tracks that I-405 cross over; the first runs north/south between McFadden and Bolsa Avenues and the second runs east/west between Goldenwest and Edwards Streets. Traffic on I-405 is the dominant source of noise in the study area. Additionally, there are several drainage structures that follow the corridor and/or cross under I-405 including the Santa Ana River which I-405 crosses over.

The project corridor has been divided into six segments for the noise study based upon major local interchanges. The following describes groups of neighborhoods in each segment:

I-405 South of Bristol Street to Euclid Street, SR-73 South to Bear Street: The land uses along I-405 in this area include commercial development such as South Coast Plaza Mall, (Activity Category C) as well as single- and multi-family residences, three neighborhood parks, and a hotel (Activity Category B). There is also a patch of farm land on the northbound side of I-405 between Fairview Road and Harbor Boulevard. The single-family residences and parks are largely on the southbound side of I-405 except between Bear Street and Fairview Road where there are both single-and multi-family residences. Located along SR-73 between Bear Street and the I-405 interchange are single-family residences. Throughout this segment, soundwalls and masonry property walls provide freeway traffic noise reduction to the majority of residences and other Activity Category B land uses.

Euclid Street to Magnolia Street: Between these two interchanges the adjacent areas on both sides of the corridor are predominantly residential, including single-family residences, townhouses, and apartments, as well as outdoor use areas of Valley Vista High School, a pre-school associated with Huntington Baptist Church, Los Alamos Park, and outdoor pool areas of Courtyard Inn and Residence Inn. The majority of residential developments have masonry property walls as well as existing soundwalls. At the south end of this segment between Euclid and Ward Streets, the surrounding areas are commercial.

Magnolia Street to Bolsa Avenue / Goldenwest Street: This area along the project corridor is largely residential including single-family residences, apartment complexes, a mobile home park, and also includes Pleasant View and College Parks. Throughout this area, existing property walls and/or soundwalls protect most of the outdoor use areas from freeway traffic noise.

Bolsa Avenue / Goldenwest Street to SR-22 / Valley View Street, SR-22 East to Springdale Street: In this segment of the highway, the adjacent land use is predominantly residential with pockets of commercial including the Westminster Mall. The land uses along I-405 include single-family residences, four schools, three neighborhood parks, an outdoor pool area of Motel 6, and a mobile home park. Land uses along SR-22 include single-family residences and two mobile home parks as well as an apartment complex without any frequent outdoor use areas exposed to traffic noise. Existing masonry property walls and soundwalls provide shielding from freeway traffic noise at the majority of residential land uses.

Valley View Street to Seal Beach Boulevard: Activity Category B land use areas in this segment along I-405 consist of single-family residences, Shapell Park, Blue Bell Park, Seal Beach Tennis Court Center, and Sunrise Senior Living. Other land use along this segment of the corridor include the Old Ranch Golf Practice Range and the Seal Beach Naval Weapons Station along the eastbound side. Existing soundwalls and masonry property walls provide freeway traffic noise reduction at Activity Category B land uses.

Seal Beach Boulevard to I-605, I-605 North to South of Katella Avenue: Along I-405 in this segment, the predominant Activity Category B land use is single-family residential and multi-family residential of Leisure World Retirement Community. Other Category B land use areas include a gazebo area of First Christian Church of Leisure World. Also located in this area is the Leisure World Library which is an Activity Category E land use. The residential land uses are protected from freeway traffic noise by existing soundwalls and property walls.

2. Results of the Noise Study Report

The NSR for this project was prepared by Parsons Transportation Group (June 2011) and approved by Caltrans Environmental Engineering Unit in June 2011.

Noise study was conducted to determine future traffic noise impacts of the proposed project at frequent human use areas within the freeway corridor. The future worst case traffic noise impact at frequent outdoor human use areas along the project corridor was modeled for the No Build Alternative and three Build Alternatives, in order to determine appropriate abatement measures.

In accordance with Title 23 CFR 772, noise abatement is considered where traffic noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures identified in the Noise Protocol include the following:

- Avoiding the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project;
- Constructing noise barriers;
- Acquiring property to serve as a buffer zone;
- Using traffic management measures to regulate types of vehicles and speeds; and
- Acoustically insulating public-use or nonprofit institutional structures.

These abatement options have been considered. However, because of the constrained configuration and suburban location of the project, abatement in the form of noise barriers is the only abatement measure considered to be feasible. Noise barrier analysis was conducted by placing soundwalls at the highway mainline shoulders, on/off-ramp shoulders and right-of-way lines within State right-of-way.

Each noise barrier was evaluated for feasibility based on achievable noise reduction (5-dB or more). For each noise barrier determined to be acoustically feasible, reasonable cost allowances were calculated. To be considered reasonable from a cost perspective, the estimated cost to build the noise barrier should be equal to or less than the total cost allowance of benefited residences calculated for the barrier.

The noise analysis considered barrier heights ranging from 8 to 16 feet. The barriers heights and locations were evaluated to determine if a minimum 5-dB attenuation at the outdoor frequent use areas of the representative receivers could be achieved. The reason for limiting the maximum soundwall height to 16 feet above the ground line is to comply with the recommendations set forth by Highway Design Manual (Caltrans,

2007). The minimum barrier height required to cut the line-of-sight from each receiver to the exhaust stacks of heavy trucks has been calculated for all feasible barriers. These heights were evaluated through calculations performed by Traffic Noise Model, version 2.5 (TNM 2.5).

Throughout the project area, there are existing soundwalls which currently protect the majority of outdoor frequent use areas from freeway traffic noise. These existing soundwalls fall into one of two categories: soundwalls that will remain and soundwalls that will need to be demolished due to the project. For those soundwalls which will remain intact because the project widening will not encroach upon them, analysis was conducted for barrier heights above the existing heights at the same location. For soundwalls which will need to be demolished due to the widening of the alignment or due to other construction details such as the construction of retaining walls, it has been assumed that in-kind replacement soundwalls will be constructed as part of the project. These in-kind replacement soundwalls would be the same length and height as the soundwall it is replacing but at a new and typically similar location and they have been included in the noise analysis. The noise prediction analysis for these in-kind replacement soundwalls are of heights that are greater than the in-kind heights.

The identified feasible soundwalls generally fall into one of three categories:

- New soundwalls.
- Soundwalls which would be in-kind replacements with greater heights at new locations due to the project widening.
- Extensions of either new soundwalls or replacement soundwalls.

The remaining soundwalls that would not be considered feasible are the in-kind replacement soundwalls and soundwall extensions that would compensate (close a gap) for the increased exposure to frequent outdoor use areas due to the removal of some of the existing embankment at local traffic overpasses. The latter has been analyzed and included as part of this report's recommendations.

The minimum heights and locations of the soundwalls that would provide feasible abatement are shown graphically on the figures in Appendix A of NSR.

Table 2-1 presents feasible and gap closure soundwalls that were considered for Build Alternative 1, and summarizes the data used to assess the abatement cost allowances at each of the considered barrier heights:

Table 2-1 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-1)

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S708,S710[2] & S718	ROW/Shoulder (NB)	706+00 to 726+50	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	19	$ 45,000	$855,000
			16	Yes	21	$ 45,000	$945,000
S733	Shoulder (SB)	730+50 to 734+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	1	$ 43,000	$ 43,000
			16	Yes	1	$ 45,000	$ 45,000
S746	ROW(NB)	745+00 to 747+00	8	Yes	1	$ 47,000	$ 47,000
			10	Yes	2	$ 49,000	$ 98,000
			12	Yes	2	$ 49,000	$ 98,000
			14	Yes	2	$ 49,000	$ 98,000
			16	Yes	2	$ 49,000	$ 98,000
S747A	ROW (SB)	741+60 to 745+90	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	1	$37,000	$37,000
			14	Yes	1	$39,000	$39,000
			16	Yes	2	$49,000	$98,000
S747B	ROW (SB)	745+90 to 749+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	1	$37,000	$37,000
			14	Yes	1	$39,000	$39,000
			16	Yes	2	$49,000	$98,000
S765	ROW (SB)	763+98 to 766+07	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-1 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-1) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S766	ROW (NB)	766+14 to 767+56	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S788 & S792[2]	Shoulder (NB)	787+00 to 797+25	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S807 & S811[3]	ROW/Shoulder (SB)	804+00 to 812+08	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	7	$37,000	$259,000
			14	Yes	9	$37,000	$333,000
			16	Yes	9	$37,000	$333,000
S828A	Shoulder (NB)	814+75 to 828+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	3	$43,000	$129,000
S828B	Shoulder (NB)	828+00 to 841+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	9	$45,000	$405,000
S841	Shoulder (SB)	837+50 to 843+00	8	Yes	2	$53,000	$106,000
			10	Yes	2	$55,000	$110,000
			12	Yes	5	$55,000	$275,000
			14	Yes	6	$55,000	$330,000
			16	Yes	7	$57,000	$399,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-1 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-1) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S857	Shoulder (SB)	856+00 to 858+25	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	7	$47,000	$329,000
			14	Yes	7	$47,000	$329,000
			16	Yes	7	$47,000	$329,000
S868	ROW (NB)	866+00 to 870+45	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	1	$35,000	$35,000
S896	ROW (NB)	894+76 to 895+86	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S910[4] & S916	Shoulder (NB)	906+00 to 918+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	5	$43,000	$215,000
			14	Yes	7	$45,000	$315,000
			16	Yes	7	$45,000	$315,000
S909 & S911[4]	Shoulder (SB)	905+00 to 912+25	8	No	NA	NA	NA
			10	Yes	4	$43,000	$172,000
			12	Yes	4	$45,000	$180,000
			14	Yes	6	$45,000	$270,000
			16	Yes	6	$45,000	$270,000
S935	ROW (NB)	932+90 to 936+75	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	3	$45,000	$135,000
			16	Yes	5	$45,000	$225,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-1 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-1) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S972[4] & S 978	Shoulder (NB)	971+00 to 984+00	8	Yes	2	$35,000	$70,000
			10	Yes	4	$37,000	$148,000
			12	Yes	6	$37,000	$222,000
			14	Yes	9	$37,000	$333,000
			16	Yes	9	$39,000	$351,000
S995[3]	ROW (SB)	993+63 to 995+59	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	2	$35,000	$70,000
S998	ROW(NB)	997+11 to 998+50	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	2	$45,000	$90,000
S1006	ROW (NB)	1004+70 to 1008+00	8	Yes	7	$51,000	$357,000
			10	Yes	7	$51,000	$357,000
			12	Yes	7	$53,000	$371,000
			14	Yes	7	$53,000	$371,000
			16	Yes	7	$53,000	$371,000
S1009	ROW(SB)	1005+65 to 1013+00	8	Yes	2	$47,000	$94,000
			10	Yes	6	$47,000	$282,000
			12	Yes	11	$49,000	$539,000
			14	Yes	11	$49,000	$539,000
			16	Yes	11	$51,000	$561,000
S1016, S1020[4] & S1024	Shoulder (NB)	1013+00 to 1025+50	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	8	$47,000	$376,000

1- Stations are approximate and correspond to I-405 mainline.
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3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-1 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-1) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S1026 & S1028[3]	Shoulder (NB)	1026+50 to 1028+70	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	1	$45,000	$45,000
S1079[3]& S1083	ROW (SB)	1080+23 to 1084+31	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	5	$49,000	$245,000
			16	Yes	5	$51,000	$255,000
S1162	Shoulder (NB)	1157+00 to 1164+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	1	$43,000	$43,000
			14	Yes	1	$43,000	$43,000
			16	No	NA	NA	NA
S1226	ROW (NB)	1223+89 to 1228+13	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	4	$47,000	$188,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-2 presents feasible and gap closure soundwalls that were considered for Build Alternative 2, and summarizes the data used to assess the abatement cost allowances at each of the considered barrier heights:

Table 2-2 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-2)

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S708,S710[2] & S718	ROW & Shoulder (NB)	706+00 to 726+50	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	20	$ 45,000	$900,000
			16	Yes	24	$ 45,000	$1,080,000
S733	Shoulder (SB)	730+50 to 734+00	8	No	NA	NA	NA
			10	Yes	1	$ 43,000	$ 43,000
			12	Yes	1	$ 43,000	$ 43,000
			14	Yes	1	$ 45,000	$ 45,000
			16	Yes	1	$ 45,000	$ 45,000
S745A	ROW (SB)	741+60 to 745+90	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	1	$ 37,000	$ 37,000
			14	Yes	2	$ 49,000	$ 98,000
			16	Yes	2	$ 49,000	$ 98,000
S745B	ROW (SB)	745+90 to 749+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	1	$ 37,000	$ 37,000
			14	Yes	2	$ 49,000	$ 98,000
			16	Yes	2	$ 49,000	$ 98,000
S746	ROW (NB)	745+00 to 747+00	8	Yes	1	$51,000	$51,000
			10	Yes	1	$51,000	$51,000
			12	Yes	1	$51,000	$51,000
			14	Yes	2	$51,000	$102,000
			16	Yes	2	$51,000	$102,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-2 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-2) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S765	ROW (SB)	763+98 to 766+07	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S766	ROW(NB)	766+14 to 767+56	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S786, S788 & S792[2]	Shoulder (NB)	783+00 to 797+25	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	3	$43,000	$129,000
S807 & S811[3]	Shoulder (SB)	804+00 to 814+00	8	Yes	7	$37,000	$259,000
			10	Yes	7	$37,000	$259,000
			12	Yes	7	$39,000	$273,000
			14	Yes	7	$39,000	$273,000
			16	Yes	9	$39,000	$351,000
S834	Shoulder (NB)	827+50 to 841+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	6	$45,000	$270,000
S841	Shoulder (SB)	837+50 to 842+75	8	Yes	2	$53,000	$106,000
			10	Yes	3	$55,000	$165,000
			12	Yes	4	$55,000	$220,000
			14	Yes	7	$55,000	$385,000
			16	Yes	7	$55,000	$385,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-2 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-2) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S857	Shoulder (SB)	856+00 to 858+25	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	7	$47,000	$329,000
			14	Yes	7	$49,000	$343,000
			16	Yes	7	$49,000	$343,000
S868	ROW (NB)	866+65 to 869+45	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	1	$35,000	$35,000
S896	ROW (NB)	894+76 to 895+86	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S907	Shoulder (SB)	904+00 to 910+50	8	Yes	1	$43,000	$43,000
			10	Yes	4	$43,000	$172,000
			12	Yes	6	$43,000	$258,000
			14	Yes	6	$45,000	$270,000
			16	Yes	6	$45,000	$270,000
S908[4] & S916	Shoulder (NB)	904+00 to 920+00	8	No	NA	NA	NA
			10	Yes	2	$43,000	$86,000
			12	Yes	5	$45,000	$225,000
			14	Yes	5	$45,000	$225,000
			16	Yes	7	$45,000	$315,000
S935	ROW (SB)	932+90 to 937+30	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	4	$45,000	$180,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-2 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-2) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S972[4] & S978	Shoulder (NB)	970+00 to 984+00	8	Yes	4	$35,000	$140,000
			10	Yes	6	$37,000	$222,000
			12	Yes	6	$37,000	$222,000
			14	Yes	6	$37,000	$222,000
			16	Yes	13	$39,000	$507,000
S995[3]	ROW (SB)	993+63 to 995+59	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	2	$37,000	$74,000
S998	ROW (NB)	997+11 to 998+50	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	2	$45,000	$90,000
			16	Yes	2	$47,000	$94,000
S1005[4] & S1009	ROW (SB)	1004+00 to 1013+00	8	Yes	2	$49,000	$98,000
			10	Yes	5	$51,000	$255,000
			12	Yes	11	$51,000	$561,000
			14	Yes	11	$51,000	$561,000
			16	Yes	11	$53,000	$583,000
S1006	ROW (NB)	1004+70 to 1008+00	8	Yes	7	$51,000	$357,000
			10	Yes	7	$51,000	$357,000
			12	Yes	7	$53,000	$371,000
			14	Yes	7	$53,000	$371,000
			16	Yes	7	$55,000	$385,000
S1016, S1020[4], S1022[3] & S1024	ROW & Shoulder (NB)	1013+00 to 1026+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	8	$47,000	$376,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-2 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-2) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S1026 & S1028[3]	ROW (NB)	1026+50 to 1030+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	1	$45,000	$45,000
S1083	ROW (SB)	1080+23 to 1084+31	8	No	NA	NA	NA
			10	Yes	2	$49,000	$98,000
			12	Yes	3	$51,000	$153,000
			14	Yes	5	$51,000	$255,000
			16	Yes	5	$51,000	$255,000
S1162	Shoulder (NB)	1157+00 to 1164+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	1	$43,000	$43,000
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S1226	ROW (NB)	1223+89 to 1228+13	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	3	$47,000	$141,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-3 presents feasible and gap closure soundwalls that were considered for Build Alternative 3, and summarizes the data used to assess the abatement cost allowances at each of the considered barrier heights:

Table 2-3 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-3)

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S614A	Shoulder (NB)	614+00 to 616+00	8	Yes	1	$37,000	$37,000
			10	Yes	1	$37,000	$37,000
			12	Yes	1	$39,000	$39,000
			14	Yes	1	$39,000	$39,000
			16	Yes	1	$41,000	$41,000
S614B	Private Property (NB)	614+84 to 615+46	8	Yes	1	$37,000	$37,000
			10	Yes	1	$39,000	$39,000
			12	Yes	1	$41,000	$41,000
			14	Yes	1	$41,000	$41,000
			16	Yes	1	$41,000	$41,000
S708,S710[2] & S718	ROW & Shoulder (NB)	706+00 to 726+50	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	19	$ 45,000	$855,000
			16	Yes	21	$ 45,000	$945,000
S733	Shoulder (SB)	730+50 to 734+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	1	$ 43,000	$ 43,000
			14	Yes	1	$ 43,000	$ 43,000
			16	Yes	1	$ 45,000	$ 45,000
S745A	ROW (SB)	741+60 to 745+90	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	1	$ 39,000	$ 39,000
			16	Yes	1	$ 49,000	$ 49,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-3 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-3)

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S745B	ROW (SB)	745+90 to 749+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	1	$ 39,000	$ 39,000
			16	Yes	2	$ 49,000	$ 98,000
S746	ROW (NB)	745+00 to 747+00	8	Yes	1	$51,000	$51,000
			10	Yes	2	$51,000	$102,000
			12	Yes	2	$51,000	$102,000
			14	Yes	2	$51,000	$102,000
			16	Yes	2	$51,000	$102,000
S765	ROW (SB)	763+98 to 766+07	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S766	ROW(NB)	766+14 to 767+56	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S786, S788 & S792[2]	Shoulder (NB)	783+00 to 797+25	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	3	$43,000	$129,000
S807 & S811[3]	Shoulder (SB)	805+00 to 814+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	7	$37,000	$259,000
			14	Yes	7	$37,000	$259,000
			16	Yes	9	$37,000	$333,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-3 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-3) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S834	Shoulder (NB)	827+50 to 841+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	11	$45,000	$495,000
S841	Shoulder (SB)	837+50 to 842+75	8	Yes	2	$53,000	$106,000
			10	Yes	3	$53,000	$159,000
			12	Yes	4	$55,000	$220,000
			14	Yes	7	$55,000	$385,000
			16	Yes	7	$55,000	$385,000
S857	Shoulder (SB)	856+00 to 858+25	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	7	$47,000	$329,000
			14	Yes	7	$49,000	$343,000
			16	Yes	7	$49,000	$343,000
S868	ROW (NB)	866+65 to 870+45	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	1	$35,000	$35,000
S896	RW (NB)	894+76 to 895+86	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	No	NA	NA	NA
S907	Shoulder (SB)	903+00 to 910+50	8	Yes	1	$43,000	$43,000
			10	Yes	4	$43,000	$172,000
			12	Yes	6	$45,000	$270,000
			14	Yes	6	$45,000	$270,000
			16	Yes	6	$45,000	$270,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-3 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-3) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S910[4] & S916	Shoulder (NB)	908+00 to 920+00	8	No	NA	NA	NA
			10	Yes	2	$43,000	$86,000
			12	Yes	7	$43,000	$301,000
			14	Yes	7	$45,000	$315,000
			16	Yes	7	$45,000	$315,000
S935	ROW (SB)	932+90 to 937+30	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	4	$45,000	$180,000
S972[4] & S 978	Shoulder (NB)	971+00 to 984+00	8	Yes	2	$35,000	$70,000
			10	Yes	4	$35,000	$140,000
			12	Yes	6	$37,000	$222,000
			14	Yes	9	$37,000	$333,000
			16	Yes	11	$37,000	$407,000
S995[3]	ROW (SB)	993+63 to 995+59	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	2	$39,000	$78,000
S998	ROW (NB)	997+11 to 998+50	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	2	$45,000	$90,000
			16	Yes	2	$47,000	$94,000
S1005[4] & S1009	ROW (SB)	1004+00 to 1013+00	8	Yes	2	$49,000	$98,000
			10	Yes	11	$51,000	$561,000
			12	Yes	11	$51,000	$561,000
			14	Yes	11	$51,000	$561,000
			16	Yes	11	$53,000	$583,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 2-3 – Summary of Feasible & Recommended Soundwalls from Noise Study Report (Alt-3) Cont.

Barrier No.	Location	Barrier Station[1]	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Resonable Allowance
S1006	ROW (NB)	1004+70 to 1008+00	8	Yes	7	$51,000	$357,000
			10	Yes	7	$51,000	$357,000
			12	Yes	7	$53,000	$371,000
			14	Yes	7	$53,000	$371,000
			16	Yes	7	$55,000	$385,000
S1016, S1020[4], S1022[3] & S1024	ROW & Shoulder (NB)	1013+00 to 1026+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	Yes	5	$47,000	$235,000
			16	Yes	8	$49,000	$392,000
S1026 & S1028[3]	ROW (NB)	1027+00 to 1028+70	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	1	$47,000	$47,000
S1083	ROW (SB)	1080+23 to 1084+31	8	No	NA	NA	NA
			10	Yes	2	$49,000	$98,000
			12	Yes	2	$51,000	$102,000
			14	Yes	5	$51,000	$255,000
			16	Yes	5	$51,000	$255,000
S1162	Shoulder (NB)	1157+00 to 1164+00	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	Yes	2	$45,000	$90,000
			14	Yes	2	$45,000	$90,000
			16	No	NA	NA	NA
S1226	ROW (NB)	1223+89 to 1228+19	8	No	NA	NA	NA
			10	No	NA	NA	NA
			12	No	NA	NA	NA
			14	No	NA	NA	NA
			16	Yes	3	$47,000	$141,000

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

3. Preliminary Noise Abatement Decision

3.4. Summary of Key Information

The Final Noise Study Report analyzes noise barrier with heights from 8 to 16-feet to determine the feasibility of noise abatement. Tables 3-1 to 3-3 summarize the preliminary noise abatement decision for Build Alternatives 1 to 3 by investigating acoustical feasibility, number of benefited residences, the total reasonableness allowance, engineer's cost estimate for the abatement, and comparison of cost versus allowance.

Wall construction cost estimates are based on masonry walls in accordance with Caltrans' standard plans and specifications. Costs estimates are derived from the Caltrans Cost Database (CCD; Caltrans, 2008-2010) which calculates an average unit cost of construction-related items from recent state transportation projects. For this project, cost estimates were based on 2008-2010 Caltrans Contract Cost data. Cost calculations for soundwalls include the cost of the wall, piles, earthwork and traffic control. The final cost estimate also includes a 10% contingency. Tables in Appendix B summarize the engineer's cost estimate for constructing these walls.

Costs of related activities such as clearing and grubbing, landscaping and typical aesthetic treatments have not been estimated since these items are variable and could change substantially depending on several project-per-project factors.

Tables 3-1 to 3-3 summarize abatement key information including reasonableness allowances and estimated construction costs for Build Alternatives 1 to 3.

3.2. Non-acoustical Factors Relating to Feasibility

Based on the preliminary project and abatement design, no non-acoustical factors related to feasibility have been identified that would be considered out of the ordinary for soundwall construction. The non-acoustical factors considered are: geometric standards (e.g., sight distances), safety, maintenance, security, geotechnical issues, and utility relocations. Some of these non-acoustical factors including geotechnical issues will have to be investigated at the design phase.

Some barriers may be constructed near private property. Therefore, all of the residences behind these barriers would need to sign Temporary Construction Easement Form prior to the beginning of construction. Barriers would not substantially affect the cost or design of other project features except for barriers located on structures. Construction requirements are considered typical for soundwall construction.

3.3. Preliminary Recommendation and Decision

The preliminary noise abatement decision presented in this section is based on preliminary project alignments and profiles, which may be subject to change. As such, the physical characteristics of noise abatement described herein also may be subject to change. If pertinent parameters change substantially during the final project design, the preliminary noise abatement decision may be changed to include abatement in the final project design. A final decision on whether and how to construct noise abatement would be made upon completion of the project design.

The preliminary noise abatement decision presented in this section will also be included in the draft EIR/S, which will be circulated for public review.

Based on the information summarized in Table 3-1 and noise reductions specified in the NSR, the following discussion presents the engineer's recommendation on the proposed height and reasonableness of each feasible and proposed soundwall for Build Alternative 1:

Euclid Street to Magnolia Street

- **Soundwalls S708, S710, and S718:** These soundwalls which act as a system would be located along the northbound I-405 edge of shoulder and right-of-way line. Soundwall S710 is an in-kind replacement of existing 375 feet long soundwall and would be reconstructed regardless of cost. Soundwall S708 is 240 feet long and extends the coverage of Soundwall S710 to compensate for the encroachment of the widening on the embankment at Talbert Avenue. Soundwall S718 is 1,405 feet long and extends the Soundwall S710 protection north along the off-ramp to Brookhurst Avenue. The minimum required wall height for Soundwall S708 to meet feasibility criterion is 12-feet as shown on Figure 8 in Appendix A1 of NSR and increasing the height of this wall would not provide any additional acoustic benefits. However, building Soundwall S718 as a uniform 16-foot high wall would provide an additional 1-dB of noise reduction for residences behind this wall. The estimated total construction cost of Soundwall S708 at 12-foot high and Soundwall S718 at 16-foot high would be $584,000 which is less than the maximum reasonable allowance of $945,000.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S708 is recommended to be a 12-foot high masonry wall and Soundwall S718 is recommended to be a 16-foot high masonry wall as shown on Figure 8 and Table 1 in Appendix A1 of this report.

- **Soundwall S733:** Soundwall S733 would be located at the shoulder of the southbound off-ramp to Brookhurst Street. Figure 8 in Appendix A1 of NSR shows the minimum heights and length of Soundwall S733 to provide feasible

abatement. The estimated total construction cost of this soundwall is $112,000 which exceeds the reasonable allowance of $43,000.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S733 is not reasonable and therefore is not recommended.

- **Soundwall S746:** Soundwall S746 would extend an existing soundwall 195 feet to the south to compensate for the encroachment of I-405 onto the existing overpass embankment and provides 5-dB of protection for a single-family residence as well as a preschool playground. The estimated total construction cost of Soundwall S746 is $59,000 which is less than the reasonable allowance of $98,000. Increased wall height would not provide any additional acoustic benefits. Figure 9 in Appendix A1 of NSR shows the height and length of Soundwall S746 to provide feasible abatement.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S746 is recommended to be a 12-foot high masonry wall as shown on Figure 9 and Table 1 in Appendix A1 of this report.

- **Soundwall S747:** Soundwall S747 would extend an existing property wall 750 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment. The southern portion of this wall (S747A) replaces the 10-foot high (430 feet long) portion of an existing property wall with a 12- to 16-foot high soundwall and the northern portion would be a new soundwall (S747B) providing traffic noise reduction for the Valley Vista high school. The minimum required wall heights for Soundwall S747 to meet feasibility criterion are as shown on Figure 9 in Appendix A1 of NSR. The estimated total construction cost of Soundwall S747A as proposed with combination of 12 to 16 feet sections would be $137,000 which exceeds the reasonable allowance of $98,000 for this segment of the wall and therefore is not recommended. In addition, the existing 10-foot high property wall provides some level of noise protection for these residences. The estimated total construction cost of Soundwall S747B as proposed at 16-foot high would be $119,000 which exceeds the reasonable allowance of $98,000. However, since the reconfigured embankment of Slater Avenue would expose nearby high school to increased traffic noise the construction of this soundwall is recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S747A is not reasonable and therefore not recommended and Soundwall S747B is recommended to be a 16-foot high masonry wall as shown on Figure 9 and Table 1 in Appendix A1 of this report.

- **Soundwall S765:** Soundwall S765 would extend an existing 16-foot high soundwall 215 feet to the north to compensate for the encroachment of I-405

onto the existing overpass embankment at Bushard Street. Although this soundwall would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of three single-family residences to additional traffic noise predicted under Alternative 1 and therefore is recommended. Figure 9 in Appendix A1 of NSR shows the location and height of Soundwall S765.

With consideration of the acoustic benefit and the incremental cost, Soundwall S765 is recommended to range from 14- to 16-foot high masonry wall as shown on Figure 9 and Table 1 in Appendix A1 of this report.

- **Soundwall S766:** Soundwall S766 would extend an existing 14-foot high soundwall 145 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at Bushard Street. Although this soundwall would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of six single-family residences to additional traffic noise predicted under Alternative 1, and therefore is recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S766 is recommended to be a 14-foot high masonry wall as shown on Figure 9 and Table 1 in Appendix A1 of this report.

- **Soundwalls S788 & S792:** Soundwall S792 is an in-kind replacement of an existing 12-foot high and 835 feet long soundwall that would be required under Alternative 1 regardless of cost. Soundwall S788 would extend the Soundwall S792 to the south by 190 feet to compensate for the exposure of freeway traffic noise to five single-family residences due to the opening provided by the structure of the northbound on-ramp from Warner Avenue over the northbound off-ramp to Magnolia Street. Furthermore, due to the configuration of these ramps, absorptive materials/panels will be required on the traffic side of Soundwall S792 and on the retaining wall associated with Warner Avenue on-ramp to prevent the traffic noise from reflecting between the soundwall and retaining wall. Although this soundwall would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of these residences to additional traffic noise predicted under Alternative 1 due to the elimination of the existing ramp structure; therefore, it is recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S788 is recommended to be a 12-foot high masonry wall as shown on Figure 10 and Table 1 in Appendix A1 of this report.

Magnolia Street to Bolsa Avenue / Goldenwest Street

- **Soundwalls S807 & S811:** Soundwall S811 is an in-kind replacement of an existing 10-foot high and 285 feet long soundwall which would be higher than the portion of wall it would replace. Soundwall S807 would be located at the edge of shoulder and extends the coverage currently provided by an existing soundwall, 580 feet southward. The minimum required wall heights for Soundwalls S807 and S811 to meet feasibility criterion are as shown on Figure 11 in Appendix A1 of NSR. However, building these soundwalls to a uniform 16-foot height would provide an additional 1-dB of noise reduction for the Pleasant View Park behind these walls. The estimated total construction cost of $258,000 includes additional replacement cost of Soundwall S811 for the increased height and complete construction of Soundwall S807 at 16-foot high, which is less than the reasonable allowance of $333,000; therefore, these soundwalls are recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwalls S807 and S811 are recommended to be 16-foot high masonry walls as shown on Figure 11 and Table 1 in Appendix A1 of this report.

- **Soundwall S828:** Soundwall S828 is 2,625 feet long and located at the edge of shoulder along the northbound side of I-405 mainline. The southern portion of this wall (S828A) partially replaces an existing 10-foot high (1,300 feet long) soundwall with additional height and the northern portion would be a new soundwall (S828B) providing traffic noise reduction for 28 residences in this area. The minimum required wall heights for Soundwall S828 to meet feasibility criterion are as shown on Figures 11 & 12 in Appendix A1 of NSR. The estimated total construction cost of S828A as proposed with combination of 12 to 16 feet sections would be $118,000 which is less than the reasonable allowance of $129,000 for this segment of the wall and therefore is recommended. However, the estimated total construction cost of Soundwall S828B as proposed with combination of 12 to 16 feet sections would be $557,000 which exceeds the reasonable allowance of $405,000 and therefore is not recommended for construction.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S828A is recommended to range from 12- to 16-foot high masonry wall as shown on Figure 11 and Table 1 in Appendix A1 of this report.

- **Soundwall S841:** Soundwall S841 would extend the coverage of an existing 12-foot high soundwall 550 feet to the north along the southbound shoulder of mainline to compensate for the encroachment of I-405 onto the existing overpass embankment at Newland Street. The minimum required wall heights for Soundwall S841 to meet feasibility criterion are as shown on Figure 12 in Appendix A1 of NSR. However, building a uniform 16-foot high wall would provide an additional 1-dB of noise reduction for residences behind this wall.

The estimated total construction cost of $214,000 for a uniform 16-foot high wall is less than the reasonable allowance of $399,000 and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S841 is reasonable and recommended to be a 16-foot high masonry wall as shown on Figure 12 and Table 1 in Appendix A1 of this report. In addition, there are two residences in this area that would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S841 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required for these residences. If building a soundwall is not reasonable due to other factors besides cost, then other types of abatement must be considered for these residences.

- **Soundwall S857:** Soundwall S857 would be 225 feet long and located at the edge of shoulder along the southbound I-405 on-ramp at Edinger Avenue. The minimum required wall height for Soundwall S857 to meet feasibility criterion are as shown on Figure 12 in Appendix A1of NSR and increased wall heights would not provide any additional acoustic benefits. The estimated total construction cost of $74,000 for this wall is less than the reasonable allowance of $329,000 and therefore this soundwall is recommended for construction.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S857 is reasonable and recommended to be a 12-foot high masonry wall as shown on Figure 12 and Table 1 in Appendix A1 of this report.

- **Soundwall S868:** Soundwall S868 would be located at the right-of-way line of the northbound off-ramp to Beach Boulevard. The minimum required wall height for Soundwall S868 to meet feasibility criterion are as shown on Figure 13 in Appendix A1 of NSR. The estimated total construction cost of this 16-foot high wall is $121,000 which exceeds the reasonable allowance of $35,000.

  With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S868 is not reasonable and therefore is not recommended.

- **Soundwall S896:** Soundwall S896 is located on I-405 northbound mainline at the right-of-way line and would extend an existing 14-foot high soundwall 110 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at McFadden Avenue. Although this wall would not provide 5-dB of noise reduction for residences in the area, it does reduce the exposure of nearby mobile homes to additional traffic noise

predicted under Alternative 1 and therefore is recommended. Figure 14 in Appendix A1 of NSR shows the location and height of Soundwall S896.

With consideration of the acoustic benefit and the incremental cost, Soundwall S896 is recommended to be a 10-foot high masonry wall as shown on Figure 14 and Table 1 in Appendix A1 of this report.

- **Soundwalls S902, S910, & S916:** These soundwalls which act as a system would be located at the edge of shoulder along the northbound side of I-405. Soundwall S902 is an in-kind replacement of existing 8-foot high (915 feet long) wall and would be reconstructed regardless of cost. Soundwall S910 is also an in-kind replacement of a 650 feet long existing soundwall that would be reconstructed with a higher height. Soundwall S916 is a new wall and together with Soundwalls S902 and S910 would provide 5-dB of traffic noise protection for five single family residences in this area. The minimum required wall heights for Soundwalls S910 and S916 to meet feasibility criterion are as shown on Figure 14 in Appendix A1 of NSR. Increased wall heights for Soundwall S910 would not provide any additional acoustic benefits. However, constructing Soundwall S916 as a uniform 16-foot high wall would provide an additional 1-dB of noise reduction for two of the residences behind this wall. The total construction cost of Soundwall S916 and the additional height requirement of Soundwall S910 are estimated at $262,000 which is less than the reasonable allowance of $315,000 and therefore these soundwalls are recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S910 is recommended to be a 10- to 14-foot high masonry wall and Soundwall S916 is recommended to be a 16-foot high masonry wall as shown on Figure 14 and Table 1 in Appendix A1 of this report.

- **Soundwalls S909, S911, & S141:** These soundwalls which act as a system would be located at the edge of shoulder along the southbound side of I-405. Soundwall S141 (1,470 feet long) is an in-kind replacement of one existing 8-foot high wall at the edge of shoulder (Sta. 912+34 to 921+50) and portion of an existing 12-foot high wall at the right-of-way line (Sta 920+60 to 926+70). The replacement for the 12-foot high will be at the shoulder of the road and it will be 8 to 10-foot high because shoulder elevation is approximately 4 feet higher than the R/W line. Due to the elevation difference, top of the wall of the 8 and 10-foot high replacement soundwall would be same as the existing 12-foot high soundwall. Soundwall S141 would be reconstructed regardless of cost. Soundwall S911 is also an in-kind replacement that would be higher than the existing 190 feet long soundwall. Soundwall S909 (435 feet long) is a new wall and together with Soundwall S911 would provide 5-dB of traffic noise protection for the College Park in this area. The minimum required wall heights for Soundwalls S909 and S911 to meet feasibility criterion are as shown on Figure 14 in Appendix A1 of NSR. Increased wall heights would

not provide any additional acoustic benefits. The total construction cost of Soundwall S909 and the additional height requirement of Soundwall S911 are estimated to be $169,000 which is less than the reasonable allowance of $270,000; and therefore these soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S911 is recommended to be a 10- to 14-foot high masonry wall and Soundwall S909 is recommended to be 14-foot high masonry wall as shown on Figure 14 and Table 1 in Appendix A1 of this report.

- **Soundwall S935:** Soundwall S935 is 335 feet long and located at the right-of-way line along the southbound I-405 on-ramp from Bolsa Avenue. The minimum required wall heights for Soundwall S935 to meet feasibility criterion are as shown on Figure 15 in Appendix A1 of NSR. However, constructing this soundwall to a uniform 14-foot high wall would provide an additional 1-dB of noise reduction for residences behind this wall. The estimated total construction cost of this 14-foot high wall at $113,000 is less than the reasonable allowance of $135,000; and therefore, Soundwall S935 is recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S935 is recommended to be a 14-foot high masonry wall as shown on Figure 15 and Table 1 in Appendix A1 of this report.

Bolsa Avenue / Goldenwest Street to SR-22 / Valley View Street, SR-22 East to Springdale Street

- **Soundwalls S182, S972, & S978:** These soundwalls which act as a system would be located at the edge of shoulder along the northbound side of I-405. Soundwall S182 is an in-kind replacement of an existing 10-foot high (1,810 feet long) wall that would be reconstructed regardless of cost. Soundwall S972 is also an in-kind replacement of the existing 10-foot high (310 feet long) soundwall with higher height. Soundwall S978 is a new wall and together with Soundwalls S972 and S182 would provide 5-dB of traffic noise protection for the frontage units of Buckingham Park and Westminster High School in this area. The minimum required wall heights for Soundwalls S972 and S978 to meet feasibility criterion are as shown on Figures 16 & 17 in Appendix A1 of NSR. The estimated total construction cost of these walls as proposed with combination of 12- to 14-foot high sections would be $350,000 which exceeds the maximum reasonable allowance of $333,000 by $17,000. Therefore, these two soundwalls would not be reasonable for providing abatement for both the school and park. As a result, Soundwall S972 will be a 10-foot high in-kind replacement of the existing 10-foot high wall and would be reconstructed regardless of cost.

At 12-foot high and shorter Soundwall S978 (600 feet long) would provide 5 dB of noise reduction for Buckingham Park. The reasonableness allowance for the shorter wall is $222,000 and the construction cost is $193,000, which means that the shorter Soundwall S978 is reasonable. Extending Soundwall S978 at 12 feet to connect to Soundwall S972 would not provide the minimum required 5-dB noise reduction at the school.

With consideration of the acoustic benefit and the incremental cost, Soundwall S978 is recommended to be a 12-foot high masonry walls as shown on Figures 16 & 17 and Table 1 in Appendix A1 of this report.

- **Soundwall S995:** Soundwall S995 would be located at the right-of-way line along the southbound side of I-405 and would replace 200 feet of an existing soundwall at the same location with new height. Figure 17 in Appendix A1 of NSR shows the minimum heights and length of Soundwall S995 to provide feasible abatement. The estimated total construction cost of this soundwall is $76,000 which exceeds the reasonable allowance of $70,000 and since there is an existing soundwall at this location, construction of this wall is not recommended.

  With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S995 is not reasonable and therefore is not recommended.

- **Soundwall S998:** Soundwall S998 would be located at the right-of-way line along the northbound side of I-405 and would extend an existing soundwall 140 feet to the north. Figure 17 in Appendix A1 of NSR shows the height and length of Soundwall S998 to provide feasible abatement. The estimated total construction cost of this wall is $53,000 which is less than the reasonable allowance of $90,000 and therefore this soundwall is recommended.

  With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S998 is recommended to be 16-foot high masonry wall as shown on Figure 17 and Table 1 in Appendix A1 of this report.

- **Soundwall S1006:** Soundwall S1006 would be 330 feet long and located at the right-of-way line along the northbound off-ramp to Westminster Boulevard. The minimum required wall height for Soundwall S1006 to meet feasibility criterion is 10-foot high as shown on Figure 17 in Appendix A1 of NSR. However, building a 16-foot high soundwall would provide an additional 4-dB of noise reduction for the exterior and interior areas of Motel 6 behind this wall. The estimated total construction cost of this 16-foot high wall is $123,000 which is less than the maximum reasonable allowance of $371,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S1006 is reasonable and therefore recommended to be a 16-foot high masonry wall as shown on Figure 17 and Table 1 in Appendix A1 of this report. In addition, the outdoor pool area and the interior rooms of Motel 6 would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S1006 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required at this location. If building a soundwall is not reasonable due to other factors besides cost, then building other types of abatement must be considered for the pool area and interior rooms facing the freeway. However, owner of the motel may decline the construction of soundwall because it would block their visibility from the freeway.

- **Soundwall S1009:** Soundwall S1009 would be 857 feet long and located at the right-of-way line along southbound on-ramp from Westminster Boulevard providing traffic noise reduction for the six frontage units of the Cascade Park and five residences in this area. The minimum required wall heights for this soundwall to meet feasibility criterion are as shown on Figures 17 & 18 in Appendix A1 of NSR. However, building a 16-foot high soundwall would provide an additional 1-dB of noise reduction for frontage units of the park. The estimated total construction cost of this soundwall is $316,000 which is less than the reasonable allowance of $561,000; and therefore this soundwall is recommended.

  With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S1009 is recommended to be a 16-foot high masonry wall as shown on Figures 17 & 18 and Table 1 in Appendix A1 of this report.

- **Soundwalls S1016, S1020, & S1024:** Soundwalls S1016 and S1020 would be located at the edge of shoulder along the northbound on-ramp from Westminster Boulevard and Soundwall S1024 would be located within the right-of-way. Soundwall S1020 (550 feet long) would be an in-kind replacement of an existing soundwall with a new height. The purpose of Soundwall S1024 is to extend the coverage of replacement Soundwall S1020 to compensate for the encroachment of I-405 onto the existing overpass embankment that would occur under Alternative 1. The minimum required heights for these soundwall to meet feasibility criterion are as shown on Figure 18 in Appendix A1 of NSR. However, building Soundwall S1016 as a uniform 16-foot high soundwall would provide an additional 1-dB of noise reduction for the School Playground area. The total construction cost of Soundwalls S1016 and S1024 including the additional height requirement of Soundwall S1020 are estimated to be $308,000 which is less than the reasonable allowance of $376,000; and therefore all three soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwalls S1016, S1020, and S1024 are recommended to be 16-foot high masonry walls as shown on Figure 18 and Table 1 in Appendix A1 of this report.

- **Soundwalls S1026 & S1028:** Soundwalls S1026 and S1028 would be located at the right-of-way line along the northbound I-405 mainline. Soundwall S1028 replaces and heightens 75 feet of an existing soundwall at its current location. Soundwall S1026 extends the coverage of the Soundwall S1028 further south to compensate for the encroachment of I-405 on to the overpass embankment that would occur under Alternative 1. The minimum required heights for these soundwall to meet feasibility criterion are as shown on Figure 18 in Appendix A1 of NSR. The total construction cost of Soundwalls S1026 and S1028 are estimated to be $91,000 which exceeds the reasonable allowance of $45,000. However, building Soundwall S1026 at 14-foot high reduces the exposure of four single-family residences to additional traffic noise predicted under Alternative 1 due to encroachment of I-405 on to the overpass embankment at Springdale Street and therefore this soundwall is recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwalls S1028 is not recommended and Soundwall S1026 is recommended to be a 14-foot high masonry wall as shown on Figure 18 and Table 1 in Appendix A1 of this report.

- **Soundwalls S1079 & S1083:** Soundwalls S1079 and S1083 would be located at the right-of-way line along the southbound I-405 mainline. Soundwall S1079 replaces and heightens 130 feet of an existing soundwall at its current location. Soundwall S1083 extends the coverage of the Soundwall S1079 further north along Valley View Street. The minimum required heights for these soundwall to meet feasibility criterion are as shown on Figure 20 in Appendix A1 of NSR. However, building Soundwall S1083 as a uniform 14-foot high soundwall would provide an additional 2-dB of noise reduction for the residences in this area. The total construction cost of Soundwalls S1083 and S1079 are estimated at $190,000 which is less than the reasonable allowance of $245,000; therefore, these soundwalls are recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwalls S1079 and S1083 are recommended to be 14-foot high masonry walls as shown on Figure 20 and Table 1 in Appendix A1 of this report.

Valley View Street to Seal Beach Boulevard

- **Soundwall S1162:** Soundwall S1162 would be located at the edge of shoulder along the northbound side of I-405 and would extend an existing soundwall 700 feet to the north. The total construction cost of this wall is estimated to be

$225,000 which exceeds the reasonable allowance of $43,000. Figure 23 in Appendix A1 of NSR shows the height and length of Soundwall S1162 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S1162 is not reasonable, and therefore is not recommended. However, this area is already partially protected by a 6-foot high private wall on top of a berm.

Seal Beach Boulevard to I-605

- **Soundwall S1226:** Soundwall S1226 is to extend the coverage of the existing soundwall 440 feet north to compensate for the encroachment of I-405 onto the existing northbound I-405 to westbound SR-22 embankment that would occur under Alternative 1. The estimated total construction cost of this wall is $163,000 which is less than the reasonable allowance of $188,000 and therfore this soundwall is recommended. Figure 25 in Appendix A1 of NSR shows the height and length of Soundwall S1226 to provide feasible abatement.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S1226 is recommended to be a 16-foot high masonry wall as shown on Figure 25 and Table 1 in Appendix A1 of this report.

Table 3-1 – Summary of Abatement Key Information Alt-1

Barrier	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Total Reasonable Allowance	Masonry Estimated Construction Cost	Cost Less than Allowance?
S708, S710[2] &S718	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	Yes	19	$855,000	$539,000	Yes
	16	Yes	21	$945,000	$584,000	Yes
S733	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	Yes	1	$43,000	$119,000	No
	16	Yes	1	$45,000	$129,000	No
S746	8	Yes	1	$47,000	$45,000	Yes
	10	Yes	2	$98,000	$52,000	Yes
	12	Yes	2	$98,000	$59,000	Yes
	14	Yes	2	$98,000	$66,000	Yes
	16	Yes	2	$98,000	$73,000	Yes
S747A	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	Yes	1	$37,000	$128,000	No
	14	Yes	1	$39,000	$144,000	No
	16	Yes	2	$98,000	$159,000	No
S747B	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	Yes	1	$37,000	$96,000	No
	14	Yes	1	$39,000	$107,000	No
	16	Yes	2	$98,000	$119,000	No

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 3-1 – Summary of Abatement Key Information Alt-1 (Cont.)

Barrier	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Total Reasonable Allowance	Masonry Estimated Construction Cost	Cost Less than Allowance?
S765 & S766	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	No	NA	NA	NA	NA
S788 & S792[2]	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	No	NA	NA	NA	NA
S807 & S 811[3]	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	Yes	7	$259,000	$208,000	Yes
	14	Yes	9	$333,000	$229,000	Yes
	16	Yes	9	$333,000	$247,000	Yes
S828A	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	3	$129,000	$118,000	Yes
S828B	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	9	$405,000	$557,000	No

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 3-1 – Summary of Abatement Key Information Alt-1 (Cont.)

Barrier	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Total Reasonable Allowance	Masonry Estimated Construction Cost	Cost Less than Allowance?
S841	8	Yes	2	$106,000	$138,000	No
	10	Yes	2	$110,000	$158,000	No
	12	Yes	5	$275,000	$177,000	Yes
	14	Yes	6	$330,000	$197,000	Yes
	16	Yes	7	$399,000	$214,000	Yes
S857	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	Yes	7	$329,000	$74,000	Yes
	14	Yes	7	$329,000	$82,000	Yes
	16	Yes	7	$329,000	$89,000	Yes
S868	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	1	$35,000	$121,000	No
S896	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	No	NA	NA	NA	NA
S910[4] & S916	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	Yes	5	$215,000	$225,000	No
	14	Yes	7	$315,000	$244, 000	Yes
	16	Yes	7	$315,000	$262,000	Yes

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 3-1 – Summary of Abatement Key Information Alt-1 (Cont.)

Barrier	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Total Reasonable Allowance	Masonry Estimated Construction Cost	Cost Less than Allowance?
S909 & S911[4]	8	No	NA	NA	NA	NA
	10	Yes	4	$172,000	$139,000	Yes
	12	Yes	4	$180,000	$154,000	Yes
	14	Yes	6	$270,000	$169,000	Yes
	16	Yes	6	$270,000	$183,000	Yes
S935	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	Yes	3	$135,000	$113, 000	Yes
	16	Yes	5	$225,000	$126,000	Yes
S972[2] & S978	8	Yes	2	$70,000	$151,000	No
	10	Yes	4	$148,000	$172,000	No
	12	Yes	6	$222,000	$193,000	Yes
	14	Yes	6	$222,000	$214,000	Yes
	16	Yes	6	$234,000	$234,000	No
S995[3]	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	2	$70,000	$76,000	No
S998	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	2	$90,000	$53,000	Yes

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 3-1 – Summary of Abatement Key Information Alt-1 (Cont.)

Barrier	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Total Reasonable Allowance	Masonry Estimated Construction Cost	Cost Less than Allowance?
S1006	8	Yes	7	$357,000	$75,000	Yes
	10	Yes	7	$357,000	$86,000	Yes
	12	Yes	7	$371,000	$99,000	Yes
	14	Yes	7	$371,000	$111,000	Yes
	16	Yes	7	$371,000	$123,000	Yes
S1009	8	Yes	2	$94,000	$191,000	No
	10	Yes	6	$282,000	$221,000	Yes
	12	Yes	11	$539,000	$254,000	Yes
	14	Yes	11	$539,000	$285,000	Yes
	16	Yes	11	$561,000	$316,000	Yes
S1016, S1020[4] & S1024	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	8	$376,000	$308,000	Yes
S1026 & S1028[3]	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	1	$45,000	$91,000	No
S1079[3] & S1083	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	Yes	5	$245,000	$190,000	Yes
	16	Yes	5	$255,000	$210,000	Yes

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Table 3-1 – Summary of Abatement Key Information Alt-1 (Cont.)

Barrier	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Total Reasonable Allowance	Masonry Estimated Construction Cost	Cost Less than Allowance?
S1162	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	Yes	1	$43,000	$250,000	No
	14	Yes	1	$43,000	$272,000	No
	16	No	NA	NA	NA	NA
S1226	8	No	NA	NA	NA	NA
	10	No	NA	NA	NA	NA
	12	No	NA	NA	NA	NA
	14	No	NA	NA	NA	NA
	16	Yes	4	$188,000	$163,000	Yes

1- Stations are approximate and correspond to I-405 mainline.
2- In-kind replacement of an existing soundwall at new location with same height.
3- Replacement of existing soundwall at same location with new height.
4- Replacement of existing soundwall at new location with new height.

Based on the information summarized in Table 3-2 and noise reductions specified in the NSR, the following discussion presents the engineer's recommendation on the proposed height and reasonableness of each soundwall for Build Alternative 2:

Euclid Street to Magnolia Street

- **Soundwalls S708, S710, and S718:** These soundwalls which act as a system would be located along the northbound I-405 edge of shoulder and right-of-way line. Soundwall S710 is an in-kind replacement of existing 375 feet long soundwall and would be reconstructed regardless of cost. Soundwall S708 is 240 feet long and extends the coverage of Soundwall S710 to compensate for the widening of the embankment at Talbert Avenue. Soundwall S718 is 1,760 feet long and extends the Soundwall S710 protection north along the off-ramp to Brookhurst Avenue. The minimum required wall height for Soundwall S708 to meet feasibility criterion is 12-feet as shown on Figure 8 in Appendix A2 of NSR and increasing the height of this wall would not provide any additional acoustic benefits. However, constructing Soundwall S718 as a uniform 16-foot high wall would provide an additional 1- to 2-dB of noise reduction for residences behind this wall. The estimated total construction cost

of Soundwalls S708 at 12-foot high and S718 at 16-foot high would be $721,000 which is less than the reasonable allowance of $1,080,000.

With consideration of the acoustic benefit and the incremental cost, Soundwall S708 is recommended to be a 12-foot high masonry wall and Soundwall S718 is recommended to be a 16-foot high masonry wall as shown on Figures 7 & 8 and Table 2 in Appendix A2 of this report.

- **Soundwall S733:** Soundwall S733 would be located at the shoulder of the southbound off-ramp to Brookhurst Street. Figure 8 in Appendix A2 of NSR shows the minimum height and length of Soundwall S733 to provide feasible abatement. The estimated total construction cost of this soundwall at $107,000 exceeds the reasonable allowance of $43,000.

  With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S733 is not reasonable and therefore is not recommended.

- **Soundwall S745:** Soundwall S745 would extend an existing property wall 750 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment. The southern portion of this wall (S745A) replaces the 10-foot high (430 feet long) portion of an existing property wall with a 12- to 14-foot soundwall and the northern portion would be a new soundwall (S745B) providing traffic noise reduction for the Valley Vista high school. The minimum required wall heights for Soundwall S745 to meet feasibility criterion are as shown on Figure 9 in Appendix A2 of NSR. The estimated total construction cost of Soundwall S745A as proposed with combination of 12 to 14 feet sections would be $137,000 which exceeds the reasonable allowance of $98,000 for this segment of the wall and therefore is not recommended. In addition, the existing 10-foot high property wall provides some level of noise protection for these residences. The estimated total construction cost of Soundwall S745B as proposed at 14-foot high would be $107,000 which exceeds the reasonable allowance of $98,000. However, since the reconfigured embankment of Slater Avenue would expose nearby high school to increased traffic noise the construction of this soundwall is recommended.

  With consideration of the acoustic benefit and the incremental cost, Soundwall S745A is not reasonable and therefore not recommended and Soundwall S745B is recommended to be a 14-foot high masonry wall as shown on Figure 9 and Table 2 in Appendix A2 of this report.

- **Soundwall S746:** Soundwall S746 would extend an existing soundwall 195 feet to the south to compensate for the encroachment of I-405 onto the existing overpass embankment and provides 5-dB of protection for a single-family residence as well as a preschool playground. Figure 9 in Appendix A2